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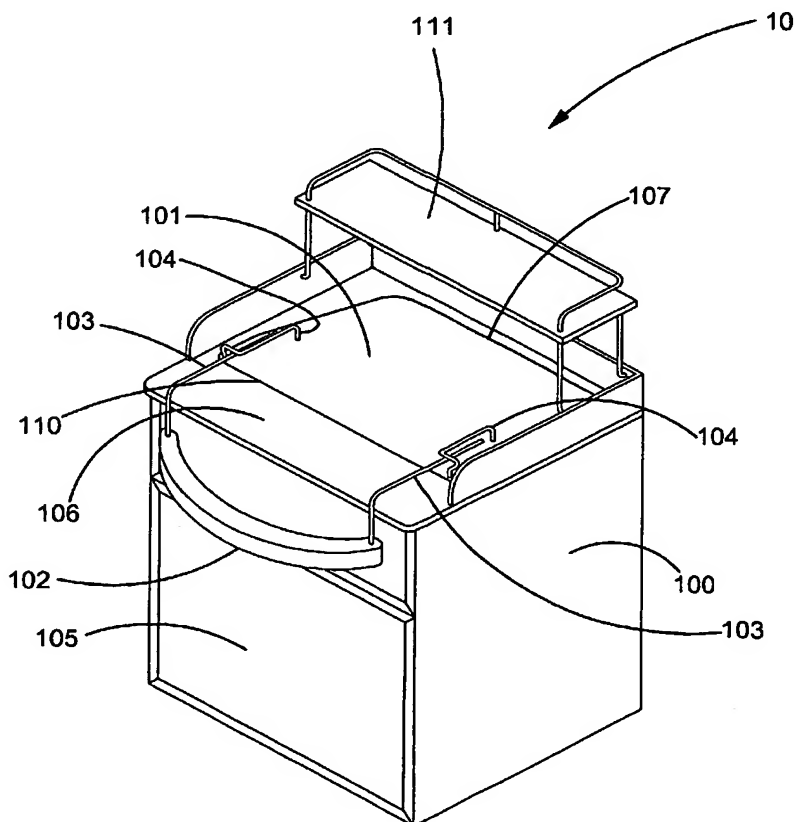
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For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: REFUSE BIN



(57) Abstract: The invention relates to a refuse bin (10) for disposing of waste on a tray (120) comprising a housing (100) having a trapdoor (101), the trapdoor having tray engaging means (104) for releasably engaging the tray (120), the trapdoor (101) being movable between a first position in which a tray (120) with waste on the tray (120) is supportable on the trapdoor (101) and a discharge position in which the trapdoor (101) and the tray (120) engaged on the trapdoor (101) are inclined so that waste on the tray (120) is discharged into the housing (100).

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REFUSE BIN**FIELD OF THE INVENTION**

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This invention relates to a refuse bin and more particularly, but not exclusively, to a refuse bin for use in disposing of waste material on a tray.

BACKGROUND TO THE INVENTION

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Refuse bins are commonly used in dining areas of fast food outlets for disposing of waste material. One type of refuse bin currently in use consists of a housing having an opening at the top of the housing. A user tips waste from a tray into the waste container. With these systems the refuse is in full view of the clients, which is not conducive to a pleasant dining experience. The continuously exposed refuse further constitutes an unhygienic environment.

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The housing of another type of bin, most commonly in use at fast food outlets, has a side opening, which is guarded by a swing flap. To use the unit, the tray has to be held in one hand, while the other hand is used to push open the swing flap, enabling the refuse to be discarded through the opening.

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The swing flap described above commonly obstructs the disposal of waste through the opening with the result that empty containers and other waste

items are swept off the tray and onto a floor of the dining area by the swing flap if the swing flap is not properly manipulated. Manipulation of the swing flap is often impeded by the user having only one hand available for disposing of the refuse on a tray. It is further not uncommon for the swing flap to become contaminated by the disposed refuse, thus making the swing flap unappealing to touch.

Once these units are filled to capacity, excess refuse is often pushed back through the opening when the swing flap returns to the closed position. The swing flap returns to the closed position without the next user or staff being alerted that the unit is full.

OBJECT OF THE INVENTION

An object of the present invention is to provide a refuse bin which, at least partially, alleviates some of the abovementioned difficulties.

SUMMARY OF THE INVENTION

According to the invention there is provided a refuse bin for disposing of waste on a tray comprising a housing having a trapdoor, the trapdoor having tray engaging means for releasably engaging the tray, the trapdoor being movable between a first position in which a tray with waste on the tray is supportable on the trapdoor and a discharge position in which the

trapdoor and tray engaged on the trapdoor were inclined so that waste on the tray is discharged into the housing.

A further feature of the invention provides for the tray engaging means to include a protrusion extending substantially normal from the trapdoor; for the protrusion in cross-section to be L-shaped so as to form a bracket for receiving an end of the tray to prevent further sliding of the tray; and for the protrusion to terminate in a lip formation to prevent an engaged tray from tipping when the trapdoor is moved to the second position.

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There is provided for the tray to be slidably engagable on the trapdoor by sliding the tray onto the trapdoor so that parts of the tray locates underneath the tray engaging means.

15 A yet further feature of the invention provides for the refuse bin to include an actuator for actuating the movement of the trapdoor between the first and discharge positions.

There is provided for the engaging means to include L-shaped sections extending from the trapdoor to locate above outer side edges of a tray on the trapdoor to prevent tipping of the tray when the trapdoor is moved to its discharge position.

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Further features of the invention provide for the trapdoor to be biased towards its first position, for the bias to be provided by a pneumatic cylinder, and for the actuator to be a hand operated lever arrangement including a handle to move the trapdoor from its first to its discharge
5 position.

The invention is used in conjunction with a waste container that is square in cross-section and its upper perimeter fits snugly against the inner surface of the housing to prevent waste from falling between the waste
10 container and the inner surface of the housing. The waste container must be wide enough for the trapdoor to extend slightly into the container with the mechanism in the open position.

These and other features of the invention are described in more detail
15 below.

BRIEF DESCRIPTION OF THE DRAWINGS

A preferred embodiment of the invention is described below, by way of
20 example only, and with reference to the accompanying drawings in which:

Figure 1 shows a perspective view of a refuse bin mechanism in a first position according to the invention;

Figure 2 shows the refuse bin mechanism of Figure 1 in the discharge position.

DETAILED DESCRIPTION OF THE DRAWINGS

5 With reference to the drawings, in which like features are indicated by like numerals, a refuse bin mechanism is generally indicated by reference numeral 10.

10 A refuse bin 10 is shown in the figures and includes a housing 100 having a trapdoor 101, the trapdoor 101 having tray engaging means 104 for releasably engaging a tray 120. The trapdoor 101 is movable between a first position as shown in figure 1 in which a tray 120 with waste on the tray can be placed on the trapdoor 101 and a discharge position as shown
15 in figure 2 in which the upper surface of the trapdoor 101 is inclined so that waste on the tray is discharged into the housing 100 while the tray remains engaged on the trapdoor 101.

The housing 100 includes a maintenance door 105 in the front of the
20 housing.

The trapdoor 101 is located on the top of the housing 100. A front edge 110 of the trapdoor 101 is hingedly connected to an inner edge of a top front panel 106 of the housing 100. The trapdoor 101 is hingeable in an

opening in the top of the housing 100 through which waste is discharged into a bin (not shown) in the housing.

The trapdoor 101 is movable between a first position as is shown in figure 1 and a discharge position, as shown in figure 2, in which the trapdoor is hinged so that an inner edge 107 of the trapdoor is located inside the housing 100 with the upper surface of the trap door inclined into the housing.

10 The trapdoor 101 includes two rails 103 on its upper surface that connects the trapdoor to the actuator handle 102. Lifting of the handle causes a movement on the rails thereby moving the trapdoor from its first to its discharge position. The rails are connected between the trapdoor and the handle 102 so that the handle is situated in front of the housing 100 and
15 below a plane defined by the top front horizontal panel 106 of the housing. Engaging means in the form of engaging rails are attached to the trapdoor. The engaging rails are L-shaped in front view such that when a tray is slid onto the trapdoor, the engaging rails are located above outer side edges of the tray to prevent the tray from being lifted upwards and off the
20 trapdoor or from tipping from the trapdoor. The engagement rails also have stops to stop the tray in position above the trapdoor as the tray is slid onto the trapdoor. This will prevent the tray to slide off the trapdoor when the trapdoor is in its second position.

In the embodiment described herein, the rails for the handle are two rods located on each side of the trapdoor and extending outside the housing. The rails abut the trapdoor and are situated substantially parallel with the side edges of the trapdoor. The rails terminate about one third of the way
5 towards a free end of the trapdoor where they are attached to the trapdoor. At their outer ends, the rails terminate in downwardly extending elbow sections for attachment to the handle.

The engaging rails are also located at the sides of the trapdoor. One end
10 of each rail has an upwardly extending stub section from the trapdoor approximately one third of the way from the hinged edge of the trapdoor. Each rail is then bent inwards and then forwards so that the stub will engage an inner edge of the tray to prevent further sliding of the tray onto the trapdoor and the forwards bent section forms a rail above side edges
15 of a tray slid onto the trapdoor. The forward bent section terminates in an outwardly extending elbow section, which in turn, terminates in a stub attached to the trapdoor.

The rails for the handle and the engaging rails may be the same rails. It
20 will be appreciated by those skilled in the art that the rails are to be shaped to releasably secure in tray on the trapdoor both when the trapdoor is in its first and discharge positions.

In use, a tray with waste material on the tray is placed between the rails 103 while the trapdoor 101 is in its first horizontal position as shown in figure 1, and slid onto the trapdoor so that the tray engages the engaging rails as is described above.

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The handle is lifted so that the trap door hinges to its discharge or second position.

10 With the trap door in its discharge position, the upper surface of the trap door and the tray are inclined into the housing thereby discharging, under force of gravity, the waste material from the tray into the bin inside the housing.

15 The trapdoor 101 is biased towards its first position by a pneumatic cylinder (not shown) or under gravitational movement provided by the handle.

20 After the handle 102 is released the trapdoor 101 returns to its first position. The empty tray can be removed from the trap door and placed in a stacking area 111.

It is envisaged that the refuse bins described herein will be useful in disposing of waste material on a tray as the user need only place the tray on the trapdoor and lift the handle. Furthermore, the waste containers can

be quickly and easily replaced or emptied. A snug fit of the waste container inside the housing ensures that no waste falls between the waste container and the housing.

- 5 Due to the leverage of the handle 102, movement of the trapdoor 101 is sudden such that spillage of fluids from used containers onto the tray is prevented.

When the refuse receptacle becomes full, the trapdoor 101 will be jammed
10 in the open position with the handle 102 in an elevated position, thus alerting the restaurant staff to take action.

To assist users, embedded images of a tray with instructions on where to place the tray appears on the top front horizontal panel 106. The handle
15 102 contains instructions to lift to clear.

CLAIMS:

1. A refuse bin for disposing of waste on a tray comprising a housing having a trapdoor, the trapdoor having tray engaging means for releasably engaging the tray, the trapdoor being
5 movable between a first position in which a tray with waste on the tray is supportable on the trapdoor and a discharge position in which the trapdoor and tray engaged on the trapdoor are inclined so that waste on the tray is discharged into the housing.

10 2. A refuse bin mechanism as claimed in claim 1 in which the tray is slidably engagable on the trapdoor by sliding the tray onto the trapdoor so that parts of the tray locates underneath the tray engaging means.

15 3. A refuse bin as claimed in any of the preceding claims in which the engaging means includes a L-shaped bracket extending from the trapdoor for engaging an edge of the tray to prevent sliding of the tray when the trapdoor is moved to the discharge
20 position.

4. A refuse bin mechanism as claimed in any one of claims 1 or 2 in which the engaging means include L-shaped sections extending from the trapdoor so that one section of each L-

shaped section locates above an outer side edge of a tray on the trapdoor to prevent tipping of the tray when the trapdoor is moved to its discharge position.

5 5. A refuse bin mechanism as claimed in any one of the preceding claims in which a handle is provided for moving the trapdoor between its first and discharge positions.

10 6. A refuse bin mechanism as claimed in any one of the preceding claims in which the trapdoor is biased towards its first position.

7. A refuse bin mechanism as claimed in claim 6 in which a pneumatic cylinder provides the bias.

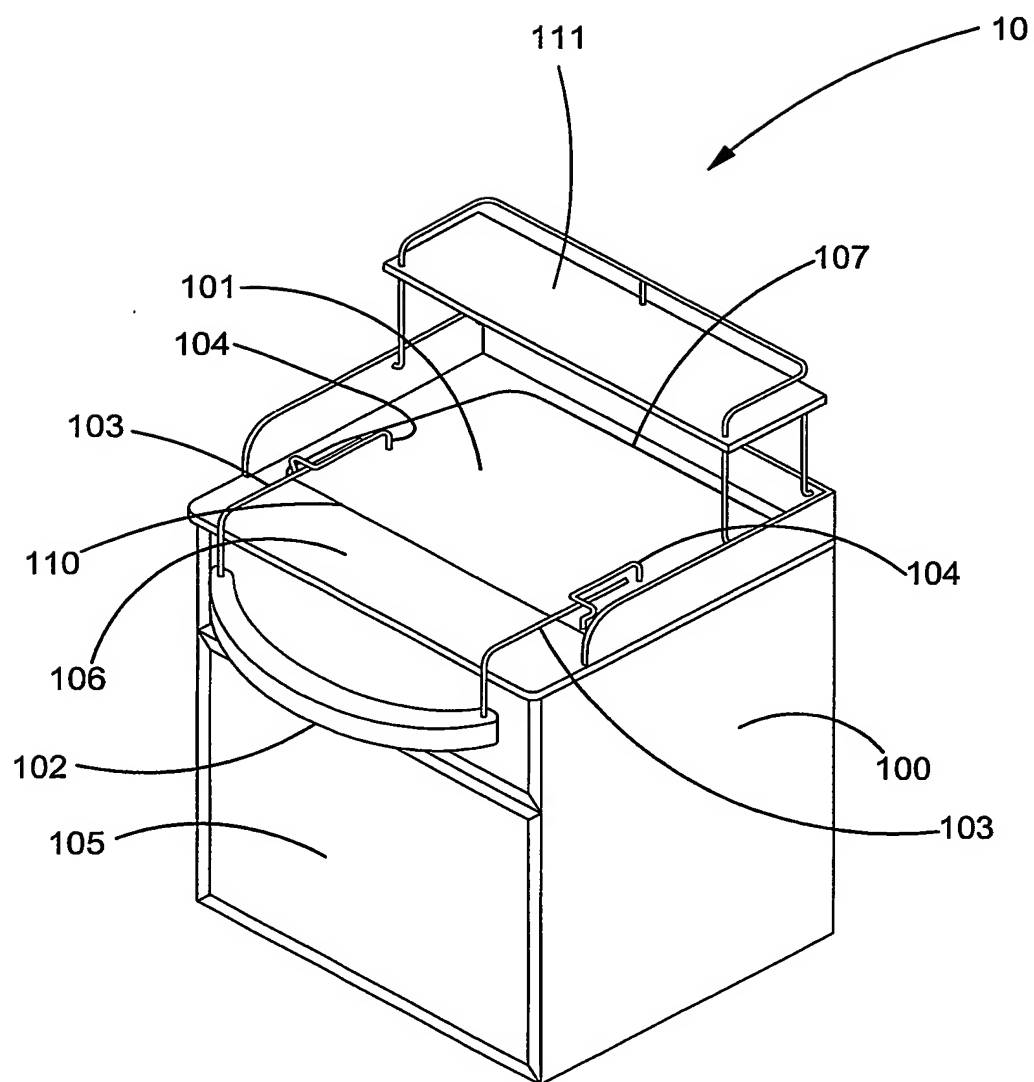
15 8. A refuse bin mechanism as claimed in claim 6 in which the handle provides the bias under force of gravity.

9. A refuse bin as claimed in any one of the preceding claims in which the housing of the refuse bin includes a waste container.

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FIGURE 1

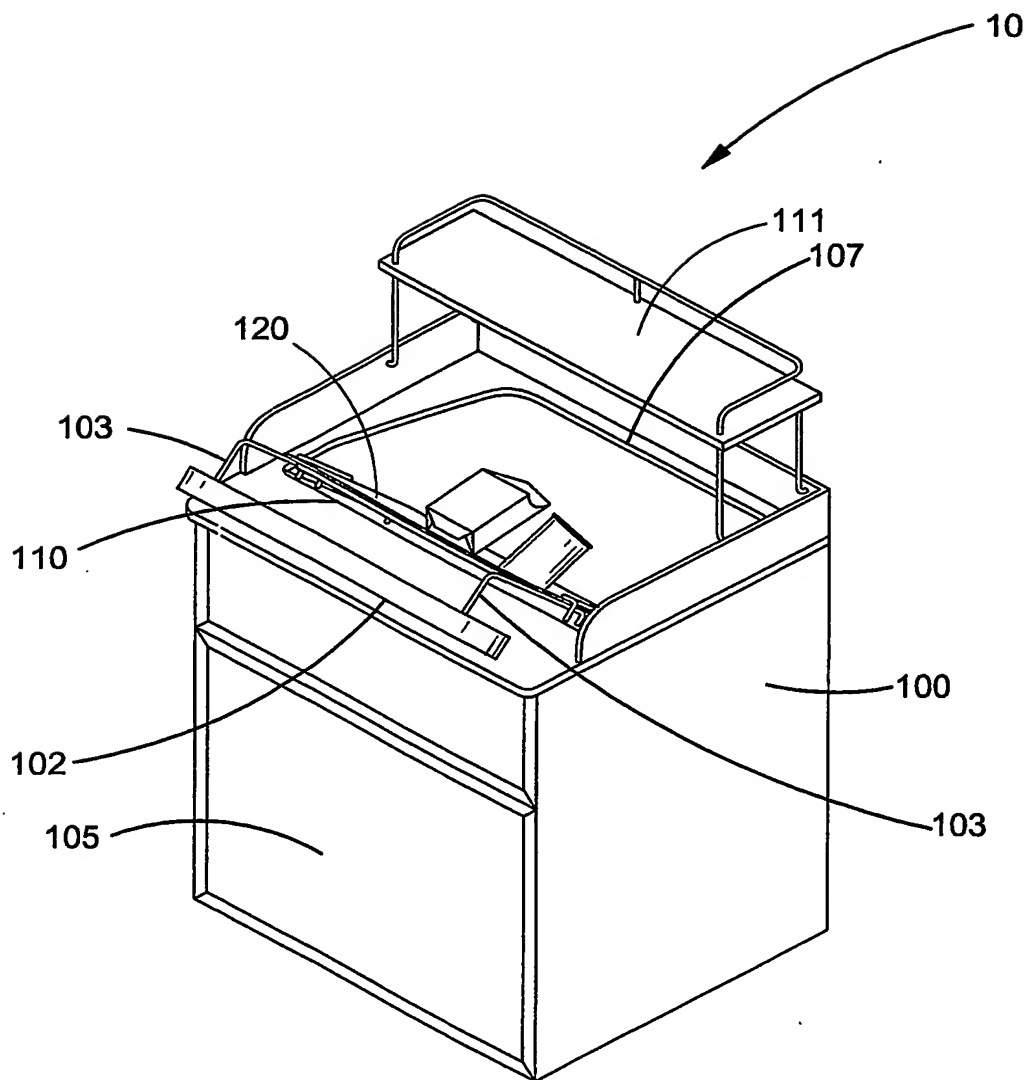


FIGURE 2

INTERNATIONAL SEARCH REPORT

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Application No

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A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 B65F1/10

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC 7 B65F

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, WPI Data, PAJ

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	PATENT ABSTRACTS OF JAPAN vol. 017, no. 497 (M-1476), 8 September 1993 (1993-09-08) -& JP 05 124708 A (BUNPEI KAJIMURA), 21 May 1993 (1993-05-21)	1-4
Y	abstract	5, 6, 9
Y	US 5 398 374 A (S. BETANCOURT) 21 March 1995 (1995-03-21) abstract; figures 1,2	5
Y	US 5 667 136 A (W. CHEN) 16 September 1997 (1997-09-16) column 5, line 21 -column 7, line 21 figures 4,5	6, 9
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☒ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

* Special categories of cited documents:

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- *&* document member of the same patent family

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INTERNATIONAL SEARCH REPORT

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Application No

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C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
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A	US 5 148 975 A (J. DICKERSON ET AL.) 22 September 1992 (1992-09-22) column 1, line 64 -column 5, line 5 figures 1-7 -----	1-4,6

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Information on patent family members

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